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**From:** Walker, Stuart [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6907CF9284BF4BD5831517C27ECE9C53-SWALKE02]  
**Sent:** 1/30/2020 11:18:19 PM  
**To:** Hays, David C Jr CIV USARMY CENWK (USA) [David.C.Hays@usace.army.mil]; fdolislager@utk.edu  
**CC:** Clements, Julie A CIV (USA) [Julie.A.Clements@usace.army.mil]; Rankins, Jonathan E CIV USARMY CEMVS (USA) [Jonathan.E.Rankins@usace.army.mil]  
**Subject:** RE: BPRG model equation question

I'll include Fred so he can add to my answer.

The GSFb, or Gamma Shielding Factor was put in the 3-D since we had a couple sites where people considered putting up material to shield the receptors from fixed contamination rather to remediate or replace the building. I remember at one of the NPL sites I think in NJ they had done that in residential basements. It was considered elsewhere, but I don't remember the site names and I think it was decided against. There is a short description in Section 4.3.12 of the User Guide

The Fr-surf which has a longer description in the User Guide is the MCNP analysis using different room sizes, density of building material, location of receptors, and thickness of contamination (gp would be for ground plane) in the 3-D scenario. We did not do such an analysis for room size in the dust scenario. There is a longer description in Section 4.3.10 of the User Guide.

Stuart Walker  
Superfund Remedial program National Radiation Expert  
Science Policy Branch  
Assessment and Remediation Division  
Office of Superfund Remediation and Technology Innovation  
W (703) 603-8748  
C (202) 262-9986

-----Original Message-----

From: Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>  
Sent: Thursday, January 30, 2020 3:17 PM  
To: Walker, Stuart <Walker.Stuart@epa.gov>  
Cc: Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>; Rankins, Jonathan E CIV USARMY CEMVS (USA) <Jonathan.E.Rankins@usace.army.mil>  
Subject: BPRG model equation question

Stuart,

In my Hunters Point review efforts I noticed that the indoor worker external risk model equations (and results) differ between the 3D-external and the Dust models. Shouldn't they be the same? I am sure I am missing something here and would appreciate you getting me thinking correctly.

The models external calculations (pCi/cm2) differ by factors GSFb and Frsurf. 3D has them and dust external does not. The GSF is not a big deal as not used for HPeval. I assume the horizontal surfaces changes things, just not sure how?

Note, the dust model includes the dissipation term which is adequately explained in the user manual as "For fixed contamination in building materials or on material surfaces in the 3-D equations, the dissipation term is not included as dissipation is not expected." With the default k=0 this term is not used in the dust model so only meaningful difference is the Fsurf, that I can tell anyway. Same issues with residential external model equations.

Appreciate any thoughts/direction.

Thank you  
Dave